

Domain	AUTOMOTIVE ELECTRICAL AND ELECTRONICS	Unit ID: 480
Title:	Carry out low-voltage wiring repairs	
Level: 2		Credits: 8

Purpose

This unit standard specifies the competencies required to carry out low-voltage wiring repairs. It includes procedures for testing and repairing low-voltage wiring and manufacturing wiring loom. This unit standard is intended for those who work as automotive electricians.

Special Notes

1. Entry information:
 - Prerequisite
 - Unit 65 - *Apply safety rules and regulations in an automotive mechanics workshop* or demonstrated equivalent knowledge and skills
2. To demonstrate competence, at a minimum, evidence is required of testing and repairing one (1) wiring loom. It includes manufacturing of a low-voltage wiring loom comprising of a minimum of three (3) different cable sizes (cross-section) and five (5) different colours according to given requirements, meeting approved specifications.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which automotive electrical and electronic operations are carried out.
4. Glossary of terms:
 - '*specifications*' refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements
 - '*low-voltage wiring*' refers to electrical circuits in which the power source does not exceed 42 volt
 - '*wiring loom*' refers to a detachable set of wires.
5. Performance of all elements in this unit standard must comply with manufacturers' specifications, workplace specific requirements and reasonable flat rate time.
6. Regulations and legislation relevant to this unit standard include the following:
 - Labour Act, No. 6, 1992
 - Occupational Health and Safety Regulations No. 18, 1997
 - Road Traffic and Transport Regulations No. 266, 2000
 and all subsequent amendments.
7. This unit standard applies to passenger and commercial vehicles, heavy plant and earthmoving equipment.

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority and the Namibia Training Authority. All approved unit standards, qualifications and national assessment arrangements are available on the Namibia Training Authority website www.nta.com.na.

Elements and Performance Criteria

Element 1: Plan and prepare for work

Range

Planning and preparation may include but is not limited to workplace inspection, equipment defect identification, assessment of conditions and hazards and determination of work requirements.

Tools and equipment may include but are not limited to standard tool set, crimping pliers and terminals, multimeter, electrical tape, cables of various sizes and colours and soft soldering equipment.

Materials may include but are not limited to spare parts, wire, tagging or labelling material and cleaning material.

Performance Criteria

- 1.1 Installation and work instructions, including repair order forms, specifications and operational details are obtained, confirmed and applied.
- 1.2 Safety requirements are followed in accordance with safety plans and policies.
- 1.3 Tools and equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults rectified or reported prior to commencement.
- 1.4 Material requirements are identified and obtained in accordance with repair order form and/or specifications.
- 1.5 Materials are safely handled and located ready for use in line with workplace procedures.
- 1.6 Technical and/or calibration requirements for tools and equipment are sourced and implemented in line with workplace procedures.
- 1.7 Environmental protection requirements are identified and applied in line with environmental plans and regulatory obligations.

Element 2: Test low voltage wiring

Range

Testing methods may include but are not limited to reading and interpreting wiring diagrams, interpretation of readings related to faults, measurements, visual and functional assessment for damage in line with manufacturers' specifications.

Faults may include but are not limited to short and open circuits, shorts to ground, frayed wires, insulation damage, corrosion, excessive resistance, burnt wiring and broken loom.

Performance Criteria

- 2.1 Procedures and information required for testing low voltage wiring are identified and sourced in line with workplace procedures.
- 2.2 Testing is implemented according to workplace procedures and manufacturers' specifications.
- 2.3 Testing results are compared with manufacturers' specifications.
- 2.4 Faults are identified and documented with evidence and supporting information.
- 2.5 Report and recommendation made are forwarded to appropriate personnel in line with workplace procedures.

Element 3: Repair low voltage wiring

Range

Faults may include but are not limited to short and open circuits, shorts to ground, frayed wires, insulation damage, burnt wiring and broken loom.

Repair methods may include but are not limited to isolation of fault(s), visual and functional assessment for damage, tagging or labeling of cables, testing and electrical measurements, reading and interpreting wiring diagrams, repairing or replacing wiring and terminals, soldering and crimping.

Performance Criteria

- 3.1 Procedures and information required for repairing low voltage wiring are identified and sourced in line with workplace procedures.
- 3.2 Repair work is completed according to workplace procedures and manufacturers' specifications.
- 3.3 Post-repair testing is carried out prior to placing in service and results are documented in line with workplace procedures.

Element 4: Manufacture wiring loom

Range

Approved specifications may include but are not limited to manufacturers' specifications, workplace procedures, non-manufacturer but industry approved standards including cable specification, size, colour and circuit protection.

Performance Criteria

- 4.1 Procedures and information required for manufacturing wiring loom are identified and sourced in line with workplace procedures.
- 4.2 Wiring loom is manufactured according to approved specifications.
- 4.3 Wiring loom is tested prior to placing in service and results are documented in line with workplace procedures.

Element 5: Complete work and clean up

Range

Work completion details may include but are not limited to repair order form, sign-out form for equipment, service record book and service plan form.

Performance Criteria

- 5.1 Work is completed and appropriate personnel notified in accordance with workplace procedures.
- 5.2 Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures.
- 5.3 Reusable material is collected and stored in accordance with workplace procedures.
- 5.4 Equipment used is cleaned, checked, maintained and stored in accordance with workplace procedures.
- 5.5 Work completion details are finalised in accordance with workplace procedures.

Registration Data

Subfield:	Automotive Engineering
Date first registered:	15 November 2007
Date this version registered:	15 November 2007
Anticipated review:	2011
Body responsible for review:	Namibia Training Authority